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- M. G. Watson, and J. E. McClintock. 280, 688, 57-C14 (1984) GARCIA, R. D. M. A High-Order Spherical Harmonics Solution to the Standard Problem in Radiative Transfer. M. Benassi, R. D. M. Garcia, A. H. Karp, and C. E. Siewert. 280, 853, 59-B5 (1984)
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- GREEN, RICHARD F. An Imaging Survey of Fields around Quasars. II.
 The Association of Galaxies with Quasars. H. K. C. Yee and Richard F. Green. 280, 79, 49-G10 (1984)
- The Close Binary Central Star of the Planetary Nebula Abell 41: A Helium-rich Subdwarf Primary. Richard F. Green, James Liebert, and F. Wesemael. 280, 177, 51-A1 (1984)
- Splitting of C IV Lines in a QSO Absorption-Line System. D. G. York, Richard F. Green, Jill Bechtold, and Frederic H. Chaffee, Jr. 280, L1, 54-C2 (1984)
- GRIFFIN, M. J. Millimeter-Wave Observations of Flat Spectrum Radio Sources. W. K. Gear, E. I. Robson, P. A. R. Ade, M. G. Smith, P. E. Clegg, C. T. Cunningham, M. J. Griffin, I. G. Nolt, and J. V. Radostitz. 280, 102, 50-B7 (1984)
- GUILLORY, JOHN. The Interaction of Relativistic Charged-Particle Beams with Interstellar Clouds. William K. Rose, John Guillory, James H. Beall, and Selig Kainer. 280, 550, 55-G8 (1984)
- GULL, THEODORE R. Ultraviolet Spectroscopy of the Planetary Nebula in the Fornax Galaxy. Stephen P. Maran, Theodore R. Gull, Theodore P. Stecher, Lawrence H. Aller, and Charles D. Keyes. 280, 615, 56-E7 (1984)
- GUZIK, T. G. The Path-Length Distribution for Galactic Cosmic-Ray Propagation: An Energy-Dependent Depletion of Short Path Lengths. M. Garcia-Munoz, T. G. Guzik, J. A. Simpson, and J. P. Wefel. 280, L13, 54-D4 (1984)
- HABBAL, SHADIA R. Fast-Mode Mangetohydrodynamic Waves in Coronal Holes and the Solar Wind. Tor Flå, Shadia R. Habbal, Thomas E. Holzer, and Egil Leer. 280, 382, 53-B4 (1984)
- HALSEY, G. W. The 12 Micron Band of Ethane: High-Resolution Laboratory Analysis with Candidate Lines for Infrared Heterodyne Searches. S. J. Daunt, A. K. Atakan, W. E. Blass, G. W. Halsey, D. E. Jennings, D.C. Reuter, J. Susskind, and J. W. Brault. 280,

921, 59-G9 (1984)

HAMMER, REINER. Energy Balance of Stellar Coronae. III. Effect of Stellar Mass and Radius. Reiner Hammer. 280, 780, 58-D3 (1984)

HARPER, D. A. NGC 2024: Far-Infrared and Radio Molecular Observations. Harley A. Thronson, Jr., Charles J. Lada, P. R. Schwartz, Howard A. Smith, J. Smith, W. Glaccum, D. A. Harper, and R. F. Loewenstein. 280, 154, 50-F5 (1984)

HARRIS, D. E. The X-Ray Features of a Single-lobed Radio Galaxy in Abell 754. D. E. Harris, C. H. Costain, and P. E. Dewdney. 280,

532, 55-F3 (1984)

HARTMANN, LEE. Rotational Velocities of Low-Mass Stars in the Pleiades. John R. Stauffer, Lee Hartmann, David R. Soderblom, and Neal Burnham. 280, 202, 51-C4 (1984)

HARVEY, PAUL M. NGC 6334-V—An Infrared Bipolar Nebula. Paul M. Harvey and Bruce A. Wilking. 280, L19, 54-D9 (1984)

HAWLEY, JOHN F. A Numerical Study of Nonspherical Black Hole Accretion. II. Finite Differencing and Code Calibration (Abstract of Paper in 1984 June Suppl.). John F. Hawley, Larry L. Smarr, and James R. Wilson. 280, 938, 60-B2 (1984)

HAYAKAWA, S. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

HAYES, DANIEL P. Variations of Betelgeuse's Optical Linear Ploarization over Four Consecutive Observing Seasons: 1979–1983 (Abstract of Paper in 1984 June Suppl.). Daniel P. Hayes. 280, 940, 60-

B4 (1984)

HEBENÝ, I. The Far-Ultraviolet Energy Distribution of Sirius B from Voyager 2. J. B. Holberg, F. Wesemael, and I. Hebený. 280, 679, 57-C5 (1984)

HECHT, J. H. The Dust around R Coronae Borealis Type Stars. J. H. Hecht, A. V. Holm, B. Donn, and Chi-Chao Wu. 280, 228, 51-E3 (1984)

HELLINGS, RONALD W. Primordial Gravitational Waves and the Black-body Radiation Anisotropy. Peter J. Adams, Ronald W. Hellings, and Robert L. Zimmerman. 280, L39, 60-D4 (1984)

HENRY, J. PATRICK. The X-Ray Luminosity Function of Abell Clusters at a Redshift of 0.25. J. Patrick Henry and Russell J. Lavery. 280, 1, 49-A6 (1984)

Infrared Observations of the 3C 273 Jets. J. Patrick Henry, E. E. Becklin, and C. M. Telesco. 280, 98, 50-B1 (1984)

HILLIER, D. J. The Influence of Electron Scattering on the He II Line Profiles of HD 50896. D. J. Hillier. 280, 744, 58-A1 (1984)

HOBBS, L. M. On Absorption by Hot Interstellar Gas. I. [Fe x] λ6375. L. M. Hobbs. 280, 132, 50-D10 (1984)

HOLBERG, J. B. The Far-Ultraviolet Energy Distribution of Sirius B

from Voyager 2. J. B. Holberg, F. Wesemael, and I. Hebený. 280, 679, 57-C5 (1984)

HOLM, A. V. The Dust around R Coronae Borealis Type Stars. J. H. Hecht, A. V. Holm, B. Donn, and Chi-Chao Wu. 280, 228, 51-E3 (1984)

HOLT, S. S. Soft X-Ray Spectral Observations of Quasars and High X-Ray Luminosity Seyfert Galaxies. R. Petre, R. F. Mushotzky, J. H. Krolik, and S. S. Holt. 280, 499, 55-C11 (1984)

HOLZER, THOMAS E. Fast-Mode Mangetohydrodynamic Waves in Coronal Holes and the Solar Wind. Tor Flå, Shadia R. Habbal, Thomas E. Holzer, and Egil Leer. 280, 382, 53-B4 (1984)

HONEYCUTT, R. KENT. A Spectroscopic Study and Mass Determination for the Cataclysmic Variable AC Cancri. Eric M. Schlegel, Ronald H. Kaitchuck, and R. Kent Honeycutt. 280, 235, 51-E10 (1984)

HOVESTADT, D. Temporal Variations of Nucleonic Abundances in Solar Flare Energetic Particle Events. II. Evidence for Large-Scale Shock Acceleration. G. M. Mason, G. Gloeckler, and D. Hovestadt. 280, 902, 59-E14 (1984)

HOWELL, R. R. The T Tauri Radio Source. P. R. Schwartz, Theodore Simon, B. Zuckerman, and R. R. Howell. 280, L23, 54-D13 (1984)

HUBICKYJ, O. A Formula for the Shakura-Sunyaev Turbulent Viscosity Parameter. V. M. Canuto, I. Goldman, and O. Hubickyj. 280, L55, 60-E6 (1984)

HUCHRA, JOHN. A Galaxy Cluster behind M87. John Huchra and Jean Brodie. 280, 547, 55-G4 (1984)

HUGHES, JOHN P. A Search for X-Ray Polarization in Cosmic X-Ray Sources. John P. Hughes, Knox S. Long, and Robert Novick. 280, 255, 51-G2 (1984)

HUNTRESS, W. T., JR. The Chemistry of Phosphorus in Dense Interstellar Clouds. L. R. Thorne, V. G. Anicich, S. S. Prasad, and W. T. Huntress, Jr. 280, 139, 50-E3 (1984)

HURLEY, K. Time History, Energy Spectrum, and Localization of an Unusual Gamma-Ray Burst. C. Barat, K. Hurley, M. Niel, G. Vedrenne, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, T. L. Cline, I. V. Estulin, V. M. Zenchenko, and V. G. Kurt. 280, 150, 50-E14 (1984)

HUT, PIET. Hard Binary-Single Star Scattering Cross Sections for Equal Masses (Abstract of Paper in 1984 June Suppl.). Piet Hut. 280, 940,

60-B4 (1984)

HUTCHINGS, J. B. Optical Imaging of 78 Quasars and Host Galaxies. J. B. Hutchings, D. Crampton, and Bruce Campbell. 280, 41, 49-D8 (1984)

An Atlas of QSO Luminosity Profiles (Abstract of Paper in 1984 June Suppl.). J. B. Hutchings, D. Crampton, B. Campbell, D. Duncan, and B. Glendenning. 280, 940, 60-B4 (1984)

HYLAND, A. R. Infrared Mapping of the M87 Jet. N. E. B. Killeen, G. V. Bicknell, A. R. Hyland, and T. J. Jones. 280, 126, 50-D3 (1984)

ILLING, RAINER M. E. The Complex Coronal Transient of 1980 March 23. Rainer M. E. Illing. 280, 399, 53-C7 (1984)

IMAMURA, JAMES N. Colliding Winds: Interaction Regions with Strong Heat Conduction. James N. Imamura and Roger A. Chevalier. 280, 313, 52-D5 (1984)

INOUE, H. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 286, 259, 51-G6 (1984)

ITOH, NAOKI. Neutrino-Pair Bremsstrahlung in Dense Stars. III. Low-Temperature Quantum Corrections in the Liquid Metal Phase. Naoki Itoh, Yasuharu Kohyama, Noriyoshi Matsumoto, and Midori

Seki. 280, 787, 58-D9 (1984)

JACKSON, JAMES M. HNCO in Molecular Clouds. James M. Jackson, J. Thomas Armstrong, and Alan H. Barrett. 280, 608, 56-D13 (1984)

JENNINGS, D. E. The 12 Micron Band of Ethane: High-Resolution Laboratory Analysis with Candidate Lines for Infrared Heterodyne Searches. S. J. Daunt, A. K. Atakan, W. E. Blass, G. W. Halsey, D. E. Jennings, D.C. Reuter, J. Susskind, and J. W. Brault. 280, 921, 59-G9 (1984)

JOHNSTON, K. J. The Radio Morphology of the X-Ray Radio Sources near 0454+844 and 1803+784. K. J. Johnston, P. Biermann, A. Eckart, H. Kühr, P. A. Strittmatter, R. G. Strom, A. Witzel, and

A. Zensus. 280, 542, 55-F13 (1984)

JONES, T. J. Infrared Mapping of the M87 Jet. N. E. B. Killeen, G. V. Bicknell, A. R. Hyland, and T. J. Jones. 280, 126, 50-D3 (1984)

KAINER, SELIG. The Interaction of Relativistic Charged-Particle Beams with Interstellar Clouds. William K. Rose, John Guillory, James H. Beall, and Selig Kainer. 280, 550, 55-G8 (1984)

KAITCHUCK, RONALD H. A Spectroscopic Study and Mass Determination for the Cataclysmic Variable AC Cancri. Eric M. Schlegel, Ronald H. Kaitchuck, and R. Kent Honeycutt. 280, 235, 51-E10 (1984)

KALLMAN, T. R. X-Ray Nebular Models. II. Constant Pressure Clouds. T. R. Kallman. 280, 269, 52-A3 (1984)

KALRA, G. L. Wave-Wave Interaction in Magneto-gravitating Plasma. S. S. Aggarwal and G. L. Kalra. 280, 792, 58-D14 (1984)

KAMPER, KARL W. The Expansion Age of the Supernova Remnant RCW 89 = MSH 15-52 (G320.4-1.2). Sidney van den Bergh and Karl W. Kamper. 280, L51, 60-E1 (1984)

KARP, A. H. A High-Order Spherical Harmonics Solution to the Standard Problem in Radiative Transfer. M. Benassi, R. D. M. Garcia, A. H. Karp, and C. E. Siewert. 280, 853, 59-B5 (1984)

KEENAN, F. P. Observational Evidence for Non-Maxwellian Electron Energy Distributions in the Solar Transition Region. P. L. Dufton, A. E. Kingston, and F. P. Keenan. 280, L35, 54-E11 (1984)

KEYES, CHARLES D. Ultraviolet Spectroscopy of the Planetary Nebula in the Fornax Galaxy. Stephen P. Maran, Theodore R. Gull, Theodore P. Stecher, Lawrence H. Aller, and Charles D. Keyes. 280, 615, 56-E7 (1984) KILLEEN, N. E. B. Infrared Mapping of the M87 Jet. N. E. B. Killeen. G. V. Bicknell, A. R. Hyland, and T. J. Jones. 280, 126, 50-D3 (1984)

KINGSTON, A. E. Observational Evidence for Non-Maxwellian Electron Energy Distributions in the Solar Transition Region. P. L. Dufton, A. E. Kingston, and F. P. Keenan. 280, L35, 54-E11 (1984)

KLEBESADEL, R. W. Time History, Energy Spectrum, and Localization of an Unusual Gamma-Ray Burst. C. Barat, K. Hurley, M. Niel, G. Vedrenne, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, T. L. Cline, I. V. Estulin, V. M. Zenchenko, and V. G. Kurt. 280, 150, 50-E14 (1984)

KODAIRA, K. Digital Surface Photometry of Galaxies toward a Quantitative Classification. III. A Mean Concentration Index as a Parameter Representing the Luminosity Distribution. S. Okamura, K. Kodaira, and M. Watanabe. 280, 7, 49-A13 (1984)

KODAIRA, KEIICHI. Absolute Photometry of the Southern Orion Region in the Vacuum Ultraviolet (1300-2000 Å). Wataru Tanaka, Takashi Onaka, Mineo Sawamura, Tetsuya Watanabe, Keiichi Kodaira, and Keizo Nishi. 280, 213, 51-D1 (1984)

KOHYAMA, YASUHARU. Neutrino-Pair Bremsstrahlung in Dense Stars. III. Low-Temperature Quantum Corrections in the Liquid Metal Phase. Naoki Itoh, Yasuharu Kohyama, Noriyoshi Matsumoto, and

Midori Seki. 280, 787, 58-D9 (1984)

KONDO, I. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

Hard X-Ray Imaging of the Solar Flare on 1981 May 13 with the Hinotori Spacecraft. S. Tsuneta, T. Takakura, N. Nitta, K. Ohki, K. Tanaka, K. Makishima, T. Murakami, M. Oda, Y. Ogawara,

and I. Kondo. 280, 887, 59-D12 (1984)

KOYAMA, K. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

KROLIK, J. H. Soft X-Ray Spectral Observations of Quasars and High X-Ray Luminosity Seyfert Galaxies. R. Petre, R. F. Mushotzky, J.

H. Krolik, and S. S. Holt. 280, 499, 55-C11 (1984)

KUHR, H. The Radio Morphology of the X-Ray Radio Sources near 0454 + 844 and 1803 + 784. K. J. Johnston, P. Biermann, A. Eckart, H. Kühr, P. A. Strittmatter, R. G. Strom, A. Witzel, and A. Zensus. 280, 542, 55-F13 (1984)

KUNIEDA, H. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1, F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

KURT, V. G. Time History, Energy Spectrum, and Localization of an Unusual Gamma-Ray Burst. C. Barat, K. Hurley, M. Niel, G. Vedrenne, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, T. L. Cline, I. V. Estulin, V. M. Zenchenko, and V. G. Kurt.

280, 150, 50-E14 (1984)

LADA, CHARLES J. NGC 2024: Far-Infrared and Radio Molecular Observations. Harley A. Thronson, Jr., Charles J. Lada, P. R. Schwartz, Howard A. Smith, J. Smith, W. Glaccum, D. A. Harper, and R. F. Loewenstein. 280, 154, 50-F5 (1984)

LAKE, GEORGE. A Successful Survey of H 1 in Low-Luminosity Elliptical Galaxies. George Lake and R. A. Schommer. 280, 107, 50-B12 (1984)

LAKHINA, G. S. Heat Flux Instability in Cometary and Solar Plasma. G. S. Lakhina and B. Buti. 280, 917, 59-G5 (1984)

LAROS, J. G. Time History, Energy Spectrum, and Localization of an Unusual Gamma-Ray Burst. C. Barat, K. Hurley, M. Niel, G. Vedrenne, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, T. L. Cline, I. V. Estulin, V. M. Zenchenko, and V. G. Kurt. 280, 150, 50-E14 (1984)

LAVERY, RUSSELL J. The X-Ray Luminosity Function of Abell Clusters at a Redshift of 0.25. J. Patrick Henry and Russell J. Lavery. 280,

1, 49-A6 (1984)

LAWRENCE, A. 1-20 Micron Infrared Photometry of 3CR Radio Galaxies. Martin Elvis, S. P. Willner, G. Fabbiano, N. P. Carleton, A. Lawrence, and Martin Ward. 280, 514, 56-B5 (1984)

LEER, EGIL. Fast-Mode Mangetohydrodynamic Waves in Coronal Holes and the Solar Wind. Tor Flå, Shadia R. Habbal, Thomas E. Holzer,

and Egil Leer. 280, 382, 53-B4 (1984)

LENA, P. The Sub-Arc Second Structure of IRc2 at 5 Microns, A. Chelli. C. Perrier, and P. Léna. 280, 163, 50-F14 (1984)

LEPP, STEPHEN. Molecules in the Early Universe. Stephen Lepp and Michael Shull. 280, 465, 55-A5 (1984)

LIEBERT, JAMES. The Close Binary Central Star of the Planetary Nebula Abell 41: A Helium-rich Subdwarf Primary. Richard F. Green, James Liebert, and F. Wesemael. 280, 177, 51-A1 (1984)

LOEWENSTEIN, R. F. NGC 2024: Far-Infrared and Radio Molecular Observations. Harley A. Thronson, Jr., Charles J. Ladu, P. R. Schwartz, Howard A. Smith, J. Smith, W. Glaccum, D. A. Harper, and R. F. Loewenstein. 280, 154, 50-F5 (1984)

LONG, KNOX S. A Search for X-Ray Polarization in Cosmic X-Ray Sources. John P. Hughes, Knox S. Long, and Robert Novick. 280,

255, 51-G2 (1984)

LUGGER, P. M. Abundance of Interstellar Aluminum. E. S. Barker, P. M. Lugger, E. J. Weiler, and D. G. York. 280, 600, 56-D5 (1984)

MACFARLANE, J. J. Statistical Mechanics of Light Elements at High Pressure. VI. Liquid-State Calculations with Thomas-Fermi-Dirac Theory. J. J. MacFarlane. 280, 339, 52-E3 (1984)

MADORE, BARRY F. On the Nonuniqueness of Self-propagating Spiral Galaxy Models. Wendy L. Freedman and Barry F. Madore. 280,

592, 56-C9 (1984)

MAKINO, F. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

MAKISHIMA, K. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, . K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

Hard X-Ray Imaging of the Solar Flare on 1981 May 13 with the Hinotori Spacecraft. S. Tsuneta, T. Takakura, N. Nitta, K. Ohki, K. Tanaka, K. Makishima, T. Murakami, M. Oda, Y. Ogawara,

and I. Kondo. 280, 887, 59-D12 (1984)

MALKAN, MATTHEW A. The Underlying Galaxies of X-Ray-Selected Quasars. Matthew A. Malkan, Bruce Margon, and Gary A. Chanan. 280, 66, 49-F7 (1984)

MARAN, STEPHEN P. Ultraviolet Spectroscopy of the Planetary Nebula in the Fornax Galaxy. Stephen P. Maran, Theodore R. Gull, Theodore P. Stecher, Lawrence H. Aller, and Charles D. Keyes. 280, 615, 56-E7 (1984)

MARASCHI, L. Two-Temperature Model of Spherical Accretion onto a Black Hole. M. Colpi, L. Maraschi, and A. Treves. 280, 319, 52-

D11 (1984)

MARGON, BRUCE. The Underlying Galaxies of X-Ray-Selected Quasars. Matthew A. Malkan, Bruce Margon, and Gary A. Chanan. 280, 66, 49-F7 (1984)

MARISKA, J. T. The Energy Relation between Hard X-Ray and O v Emission in Solar Flares. A. I. Poland, L. E. Orwig, J. T. Mariska, R. Nakatsuka, and L. H. Auer. 280, 457, 53-G11 (1984)

MASAI, K. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

MASON, G. M. Temporal Variations of Nucleonic Abundances in Solar Flare Energetic Particle Events. II. Evidence for Large-Scale Shock Acceleration. G. M. Mason, G. Gloeckler, and D. Hovestadt. 280,

902, 59-E14 (1984)

MATEO, MARIO. An Unprecedented UV/Optical Flare in TV Columbae. Paula Szkody and Mario Mateo. 280, 729, 57-F13 (1984)

MATHEWSON, D. S. Supernova Remnants in the Magellanic Clouds (Abstract of Paper in 1984 June Suppl.). D. S. Mathewson, V. L. Ford, M. A. Dopita, I. R. Tuohy, B. Y. Mills, and A. J. Turtle. 280, 938, 60-B2 (1984)

MATHEZ, G. Simultaneous Study of Optical and X-Ray Properties of the Coma Cluster by Multi-Mass Models. G. des Forêts, R. Dominguez-Tenreiro, D. Gerbal, G. Mathez, A. Mazure, and E. Salvador-Solé. 280, 15, 49-B9 (1984)

MATSUMOTO, NORIYOSHI. Neutrino-Pair Bremsstrahlung in Dense Stars. III. Low-Temperature Quantum Corrections in the Liquid Metal Phase. Naoki Itoh, Yasuharu Kohyama, Noriyoshi Matsumoto, and

Midori Seki. 280, 787, 58-D9 (1984)

MATSUOKA, M. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

MAZURE, A. Simultaneous Study of Optical and X-Ray Properties of the Coma Cluster by Multi-Mass Models. G. des Forêts, R. Dominguez-Tenreiro, D. Gerbal, G. Mathez, A. Mazure, and E. Sal-

vador-Solé. 280, 15, 49-B9 (1984)

McCabe, M. The Sun as a Star: 1982 June 14-August 13. R. Fisher, M. McCabe, D. Mickey, P. Seagraves, and D. G. Sime. 280, 873, 59-C11 (1984)

McCLINTOCK, J. E. Identification of Two Hard X-Ray Emitting Be Stars Using the HEAO I Scanning Modulation Collimator. J. E. Steiner, A. Ferrara, M. Garcia, J. Patterson, D. A. Schwartz, R. S. Warwick, M. G. Watson, and J. E. McClintock. 280, 688, 57-C14 (1984)

McClure, Robert D. The Binary Nature of the CH Stars. Robert D.

McClure. 280, L31, 54-E7 (1984)

MERRITT, DAVID. The Nature of Multiple-Nucleus Cluster Galaxies.

David Merritt. 280, L5, 54-C6 (1984)

MEWALDT, R. A. A High-Resolution Study of the Isotopes of Solar Flare Nuclei. R. A. Mewaldt, J. D. Spalding, and E. C. Stone. 280, 892, 59-E4 (1984)

MICHAUD, G. Diffusion-induced Hydrogen Burning in Helium-rich White Dwarfs. G. Michaud, G. Fontaine, and Y. Charland. 280, 247, 51-FR (1984)

MICKEY, D. The Sun as a Star: 1982 June 14-August 13. R. Fisher, M. McCabe, D. Mickey, P. Seagraves, and D. G. Sime. 280, 873, 59-C11 (1984)

MILLS, B. Y. Supernova Remnants in the Magellanic Clouds (Abstract of Paper in 1984 June Suppl.). D. S. Mathewson, V. L. Ford, M. A. Dopita, I. R. Tuohy, B. Y. Mills, and A. J. Turtle. 280, 938, 60-B2 (1984)

MIYAMOTO, S. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

MORRISON, PHILIP. Relativistic Jet Meets Target: The Gamma-Rays from 3C 273. Philip Morrison, Dana Roberts, and Alberto Sadun.

280, 483, 55-B9 (1984)

MOULD, J. R. The Intermediate Age SMC Globular Cluster Lindsay 113. J. R. Mould, G. S. Da Costa, and M. D. Crawford. 280, 595, 56-C12 (1984)

MULLAN, D. J. Alfvén Waves in the Solar Wind in Association with Solar Energetic Particles: Sunspot Umbral Origin? D. J. Mullan and A. J. Owens. 280, 346, 52-E10 (1984)

MUNDT, REINHARD. Mass Loss in T Tauri Stars: Observational Studies of the Cool Parts of Their Stellar Winds and Expanding Shells. Reinhard Mundt. 280, 749, 58-A9 (1984)

MUNRO, RICHARD H. Coronal Transient Geometry. I. The Flare-associated Event of 1981 March 25. Richard R. Fisher and Richard H. Munro. 280, 428, 53-E10 (1984)

MURAKAMI, T. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

Hard X-Ray Imaging of the Solar Flare on 1981 May 13 with the Hinotori Spacecraft. S. Tsuneta, T. Takakura, N. Nitta, K. Ohki, K. Tanaka, K. Makishima, T. Murakami, M. Oda, Y. Ogawara,

and I. Kondo. 280, 887, 59-D12 (1984)

- MUSHOTZKY, R. F. Soft X-Ray Spectral Observations of Quasars and High X-Ray Luminosity Seyfert Galaxies. R. Petre, R. F. Mushotzky, J. H. Krolik, and S. S. Holt. 280, 499, 55-C11 (1984)
- NAGASE, F. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

NAKATSUKA, R. The Energy Relation between Hard X-Ray and O v Emission in Solar Flares. A. I. Poland, L. E. Orwig, J. T. Mariska, R. Nakatsuka, and L. H. Auer. 280, 457, 53-G11 (1984)

NIEL, M. Time History, Energy Spectrum, and Localization of an Unusual Gamma-Ray Burst. C. Barat, K. Hurley, M. Niel, G. Vedrenne, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, T. L. Cline, I. V. Estulin, V. M. Zenchenko, and V. G. Kurt. 280, 150, 50-E14 (1984)

NISHI, KEIZO. Absolute Photometry of the Southern Orion Region in the Vacuum Ultraviolet (1300-2000 Å). Wataru Tanaka, Takashi Onaka, Mineo Sawamura, Tetsuya Watanabe, Keiichi Kodaira,

and Keizo Nishi. 280, 213, 51-D1 (1984)

NITTA, N. Hard X-Ray Imaging of the Solar Flare on 1981 May 13 with the Hinotori Spacecraft. S. Tsuneta, T. Takakura, N. Nitta, K. Ohki, K. Tanaka, K. Makishima, T. Murakami, M. Oda, Y. Ogawara, and I. Kondo. 280, 887, 59-D12 (1984)

NOLT, I. G. Millimeter-Wave Observations of Flat Spectrum Radio Sources. W. K. Gear, E. I. Robson, P. A. R. Ade, M. G. Smith, P. E. Clegg, C. T. Cunningham, M. J. Griffin, I. G. Nolt, and J. V. Radostitz. 280, 102, 50-B7 (1984)

NOVICK, R. Polarization Evidence for the Isotropy of Electrons Responsible for the Production of 5-20 keV X-Rays in Solar Flares. Leonard J. Tramiel, Gary A. Chanan, and R. Novick. 280, 440,

3-F8 (1984)

NOVICK, ROBERT. A Search for X-Ray Polarization in Cosmic X-Ray Sources. John P. Hughes, Knox S. Long, and Robert Novick. 280, 255, 51-G2 (1984)

ODA, M. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

Hard X-Ray Imaging of the Solar Flare on 1981 May 13 with the Hinotori Spacecraft. S. Tsuneta, T. Takakura, N. Nitta, K. Ohki, K. Tanaka, K. Makishima, T. Murakami, M. Oda, Y. Ogawara,

and I. Kondo. 280, 887, 59-D12 (1984)

OGAWARA, Y. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

Hard X-Ray Imaging of the Solar Flare on 1981 May 13 with the Hinotori Spacecraft. S. Tsuneta, T. Takakura, N. Nitta, K. Ohki,

K. Tanaka, K. Makishima, T. Murakami, M. Oda, Y. Ogawara, and I. Kondo. 280, 887, 59-D12 (1984)

OHASHI, T. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

OHKI, K. Hard X-Ray Imaging of the Solar Flare on 1981 May 13 with the Hinotori Spacecraft. S. Tsuneta, T. Takakura, N. Nitta, K. Ohki, K. Tanaka, K. Makishima, T. Murakami, M. Oda, Y. Oga-

wara, and I. Kondo. 280, 887, 59-D12 (1984)

OKAMURA, S. Digital Surface Photometry of Galaxies toward a Quantitative Classification. III. A Mean Concentration Index as a Parameter Representing the Luminosity Distribution. S. Okamura, K. Kodaira, and M. Watanabe. 280, 7, 49-A13 (1984)

ONAKA, TAKASHI. Absolute Photometry of the Southern Orion Region in the Vacuum Ultraviolet (1300-2000 Å). Wataru Tanaka, Takashi Onaka, Mineo Sawamura, Tetsuya Watanabe, Keiichi Kodaira, and Keizo Nishi. 280, 213, 51-D1 (1984)

ORWIG, L. E. The Energy Relation between Hard X-Ray and O v Emission in Solar Flares. A. I. Poland, L. E. Orwig, J. T. Mariska, R. Nakatsuka, and L. H. Auer. 280, 457, 53-G11 (1984)

OSTERBROCK, DONALD E. The Luminosity Function of Seyfert Galaxies and the Cluster 3C 295. Donald E. Osterbrock. 280, L43, 60-D7

(1984)

OWENS, A. J. Alfvén Waves in the Solar Wind in Association with Solar Energetic Particles: Sunspot Umbral Origin? D. J. Mullan and A. J. Owens. 280, 346, 52-E10 (1984)

PANCHAPAKESAN, N. Gamma-Rays from Rotating Black Holes. N. Panchapakesan and Vijoy Prakash. 280, 848, 59-A14 (1984)

PANEK, ROBERT J. Ultraviolet Spectral Morphology of the O Stars: The Remarkable Luminosity Dependence of the Si IV Stellar Wind Effect. Nolan R. Walborn and Robert J. Panek. 280, L27, 54-E3 (1984)

PARKER, E. N. Depth of Origin of Solar Active Regions. E. N. Parker.

280, 453, 53-E5 (1984)

PATTERSON, A. Flares in Hale 17760: Magnetic Transients in the 1981

July 27 Flare. A. Patterson. 280, 879, 59-D3 (1984)

PATTERSON, J. Identification of Two Hard X-Ray Emitting Be Stars Using the HEAO 1 Scanning Modulation Collimator. J. E. Steiner, A. Ferrara, M. Garcia, J. Patterson, D. A. Schwartz, R. S. Warwick, M. G. Watson, and J. E. McClintock. 280, 688, 57-C14 (1984)

PATUREL, G. The 21 Centimeter Line Width as an Extragalactic Distance Indicator. III. The Correction for Velocity Dispersion and the B- and H-Band Tully-Fisher Relations. L. Bottinelli, L. Gouguenheim, G. Paturel, and G. de Vaucouleurs. 280, 34, 49-C14

PERRIER, C. The Sub-Arc Second Structure of IRc2 at 5 Microns. A. Chelli, C. Perrier, and P. Léna. 280, 163, 50-F14 (1984)

PETRE, R. Soft X-Ray Spectral Observations of Quasars and High X-Ray Luminosity Seyfert Galaxies. R. Petre, R. F. Mushotzky, J. H. Krolik, and S. S. Holt. 280, 499, 55-C11 (1984)

POLAND, A. I. The Energy Relation between Hard X-Ray and O v Emission in Solar Flares. A. I. Poland, L. E. Orwig, J. T. Mariska, R. Nakatsuka, and L. H. Auer. 280, 457, 53-G11 (1984)

PONGRATZ, MORRIS B. The Laboratory Simulation of Unmagnetized Supernova Remnants: Absence of a Blast Wave. Joseph E. Borovsky, Morris B. Pongratz, Robert A. Roussel-Dupré, and Tai-Ho Tan. 280, 802, 58-E10 (1984)

PRAKASH, VIJOY. Gamma-Rays from Rotating Black Holes. N. Panchapakesan and Vijoy Prakash. 280, 848, 59-A14 (1984)

PRASAD, S. S. The Chemistry of Phosphorus in Dense Interstellar Clouds. L. R. Thorne, V. G. Anicich, S. S. Prasad, and W. T. Huntress, Jr. 280, 139, 50-E3 (1984)

PRIEDHORSKY, W. C. Long-Term Observations of X-Ray Sources: The Aquila-Serpens-Scutum Region. W. C. Priedhorsky and J. Terrell. 280, 661, 57-A14 (1984)

PROTHEROE, R. J. First Observation of Gamma-Rays from Vela X-1 at Energies Greater than 3 × 1015 eV. R. J. Protheroe, R. W. Clay, and P. R. Gerhardy. 280, L47, 60-D10 (1984)

PTAK, ROGER. C IV A1550 Emission Profiles in IUE Spectra of Syefert 1 Galaxies. Ronald Stoner and Roger Ptak. 280, 516, 55-D14 (1984)

RADOSTITZ, J. V. Millimeter-Wave Observations of Flat Spectrum Radio Sources. W. K. Gear, E. I. Robson, P. A. R. Ade, M. G. Smith, P. E. Clegg, C. T. Cunningham, M. J. Griffin, I. G. Nolt, and J. V. Radostitz. 280, 102, 50-B7 (1984)

RANKIN, JOANNA M. Pulsar Polarization Fluctuations. II. 800 MHz Statistical Summaries (Abstract of Paper in 1984 June Suppl.). Daniel R. Stinebring, J. M. Cordes, J. M. Weisberg, Joanna M. Rankin,

and Valentin Boriakoff. 280, 939, 60-B3 (1984)

Pulsar Polarization Fluctuations. I. 1404 MHz Statistical Summaries (Abstract of Paper in 1984 June Suppl.). Daniel R. Stinebring, J. M. Cordes, Joanna M. Rankin, J. M. Weisberg, and Valentin Boriakoff. 280, 939, 60-B3 (1984)

REUTER, D.C. The 12 Micron Band of Ethane: High-Resolution Laboratory Analysis with Candidate Lines for Infrared Heterodyne Searches. S. J. Daunt, A. K. Atakan, W. E. Blass, G. W. Halsey, D. E. Jennings, D.C. Reuter, J. Susskind, and J. W. Brault. 280, 921, 59-G9 (1984)

RIEKE, G. H. The Spatial Extent of the 3.3 Micron Emission Feature in the Seyfert Galaxy NGC 7469. Roc M. Cutri, Richard J. Rudy,

G. H. Rieke, Alan T. Tokunaga, and S. P. Willner. 280, 521, 55-E6 (1984)

ROBERTS, DANA. Relativistic Jet Meets Target: The Gamma-Rays from 3C 273. Philip Morrison, Dana Roberts, and Alberto Sadun. 280, 483, 55-B9 (1984)

ROBSON, E. I. Millimeter-Wave Observations of Flat Spectrum Radio Sources. W. K. Gear, E. I. Robson, P. A. R. Ade, M. G. Smith, P. E. Clegg, C. T. Cunningham, M. J. Griffin, I. G. Nolt, and J. V. Radostitz. 280, 102, 50-B7 (1984)

ROOD, ROBERT T. The 8.7 GHz Hyperfine Line of 3He+ in Galactic H 11 Regions. Robert T. Rood, T. M. Bania, and T. L. Wilson. 280,

629, 56-F7 (1984)

ROSE, WILLIAM K. The Interaction of Relativistic Charged-Particle Beams with Interstellar Clouds. William K. Rose, John Guillory, James H. Beall, and Selig Kainer. 280, 550, 55-G8 (1984)

Ross, R. R. Models of the Hard X-Ray Spectrum of AM Herculis and Implications for the Accretion Rate. J. H. Swank, A. C. Fabian,

and R. R. Ross. 280, 734, 57-G3 (1984)

ROUSSEL-DUPRÉ, ROBERT A. The Laboratory Simulation of Unmagnetized Supernova Remnants: Absence of a Blast Wave. Joseph E. Borovsky, Morris B. Pongratz, Robert A. Roussel-Dupré, and Tai-Ho Tan. 280, 802, 58-E10 (1984)

RUDY, RICHARD J. The Spatial Extent of the 3.3 Micron Emission Feature in the Seyfert Galaxy NGC 7469. Roc M. Cutri, Richard J. Rudy, G. H. Rieke, Alan T. Tokunaga, and S. P. Willner. 280, 521, 55-E6 (1984)

SADUN, ALBERTO. Relativistic Jet Meets Target: The Gamma-Rays from 3C 273. Philip Morrison, Dana Roberts, and Alberto Sadun. 280, 483, 55-B9 (1984)

SALVADOR-SOLÉ, E. Simultaneous Study of Optical and X-Ray Properties of the Coma Cluster by Multi-Mass Models. G. des Forêts, R. Dominguez-Tenreiro, D. Gerbal, G. Mathez, A. Mazure, and E.

Salvador-Solé. 280, 15, 49-B9 (1984)

SATO, N. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

SAWAMURA, MINEO. Absolute Photometry of the Southern Orion Region in the Vacuum Ultraviolet (1300-2000 Å). Wataru Tanaka, Takashi Onaka, Mineo Sawamura, Tetsuva Watanabe, Keiichi Ko-

daira, and Keizo Nishi. 280, 213, 51-D1 (1984)

SCHLEGEL, ERIC M. A Spectroscopic Study and Mass Determination for the Cataclysmic Variable AC Cancri. Eric M. Schlegel, Ronald H. Kaitchuck, and R. Kent Honeycutt. 280, 235, 51-E10 (1984)

SCHOMMER, R. A. A Successful Survey of H 1 in Low-Luminosity Elliptical Galaxies. George Lake and R. A. Schommer. 280, 107, 50-B12 (1984)

SCHWARTZ, D. A. Identification of Two Hard X-Ray Emitting Be Stars Using the HEAO 1 Scanning Modulation Collimator. J. E. Steiner, A. Ferrara, M. Garcia, J. Patterson, D. A. Schwartz, R. S. War-

wick, M. G. Watson, and J. E. McClintock. 280, 688, 57-C14 (1984) SCHWARTZ, P. R. NGC 2024: Far-Infrared and Radio Molecular Observations. Harley A. Thronson, Jr., Charles J. Lada, P. R. Schwartz, Howard A. Smith, J. Smith, W. Glaccum, D. A. Harper, and R. F. Loewenstein. 280, 154, 50-F5 (1984)

The T Tauri Radio Source. P. R. Schwartz, Theodore Simon, B. Zuckerman, and R. R. Howell. 280, L23, 54-D13 (1984)

SCHWEIZER, MARTIN A. Opacities for Comptonization Plus Emission and Absorption. Martin A. Schweizer. 280, 809, 58-F3 (1984)

SCOTT, JOHN S. The Scattering of Energetic Particles by Waves in a Finite B Plasma. Joseph M. Davila and John S. Scott. 280, 334, 52-E12 (1984)

SCRIMGER, J. NORMAN. Helium 1 A10830 Line Strengths in Plantary Nebulae. J. Norman Scrimger. 280, 170, 50-G7 (1984)

SEAGRAVES, P. The Sun as a Star: 1982 June 14-August 13. R. Fisher, M. McCabe, D. Mickey, P. Seagraves, and D. G. Sime. 280, 873, 59-C11 (1984)

SEELY, J. F. Direct Measurement of the Increase in Altitude of the Soft X-Ray Emission Region during a Solar Flare. J. F. Seely and U. Feldman. 280, L59, 60-E10 (1984)

SEKI, MIDORI. Neutrino-Pair Bremsstrahlung in Dense Stars. III. Low-Temperature Quantum Corrections in the Liquid Metal Phase. Naoki Itoh, Yasuharu Kohyama, Noriyoshi Matsumoto, and Midori Seki. 280, 787, 58-D9 (1984)

SHAFER, R. A. Luminosity Enhancement in Relativistic Jets and Altered Luminosity Functions for Beamed Objects. C. M. Urry and R. A. Shafer. 280, 569, 55-A14 (1984)

SHARMA, R. R. Comparative Study of the Loss Cone-driven Instabilities in the Low Solar Corona. R. R. Sharma and Loukas Vlahos. 280, 405, 53-D1 (1984)

SHAYA, EDWARD J. Supercluster-Supercluster Interactions. Edward J. Shaya. 280, 470, 55-A10 (1984)

SHIBAZAKI, N. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

SHUDER, JAMES M. Emission-Line Profiles in Low-Redshift QSOs. James

M. Shuder. 280, 491, 55-C3 (1984)

SHULL, MICHAEL. Molecules in the Early Universe. Stephen Lepp and
Michael Shull. 280, 465, 55-A5 (1984)

SIEWERT, C. E. A High-Order Spherical Harmonics Solution to the Standard Problem in Radiative Transfer. M. Benassi, R. D. M. Garcia, A. H. Karp, and C. E. Siewert. 280, 853, 59-B5 (1984)

SIME, D. G. The Sun as a Star: 1982 June 14–August 13. R. Fisher, M. McCabe, D. Mickey, P. Seagraves, and D. G. Sime. 280, 873, 59-C11 (1984)

SIMON, THEODORE. The T Tauri Radio Source. P. R. Schwartz, Theodore Simon, B. Zuckerman, and R. R. Howell. 280, L23, 54-D13 (1984)

SIMPSON, J. A. The Path-Length Distribution for Galactic Cosmic-Ray Propagation: An Energy-Dependent Depletion of Short Path Lengths. M. Garcia-Munoz, T. G. Guzik, J. A. Simpson, and J. P. Wefel. 280, L13, 54-D4 (1984)

SKILLMAN, EVAN D. The Kinematics of Giant Extragalactic H II Regions. Evan D. Skillman and Bruce Balick. 280, 580, 56-B11 (1984)

SMARR, LARRY L. A Numerical Study of Nonspherical Black Hole Accretion. II. Finite Differencing and Code Calibration (Abstract of Paper in 1984 June Suppl.). John F. Hawley, Larry L. Smarr, and James R. Wilson. 280, 938, 60-B2 (1984)

SMITH, BRUCE. Stochastic Self-propagating Star Formation in Threedimensional Disk Galaxy Simulations: Erratum. Thomas Statler, Neil Comins, and Bruce Smith. 280, 937, 60-B1 (1984) (Orig, paper

in 270, 79, 77-G3)

SMITH, HOWARD A. NGC 2024: Far-Infrared and Radio Molecular Observations. Harley A. Thronson, Jr., Charles J. Lada, P. R. Schwartz, Howard A. Smith, J. Smith, W. Glaccum, D. A. Harper, and R. F. Loewenstein. 280, 154, 50-F5 (1984)

SMITH, J. NGC 2024: Far-Infrared and Radio Molecular Observations. Harley A. Thronson, Jr., Charles J. Lada, P. R. Schwartz, Howard A. Smith, J. Smith, W. Glaccum, D. A. Harper, and R. F. Loew-

enstein. 280, 154, 50-F5 (1984)

SMITH, M. G. Millimeter-Wave Observations of Flat Spectrum Radio Sources. W. K. Gear, E. I. Robson, P. A. R. Ade, M. G. Smith, P. E. Clegg, C. T. Cunningham, M. J. Griffin, I. G. Nolt, and J. V. Radostitz. 280, 102, 50-B7 (1984)

SODERBLOM, DAVID R. Rotational Velocities of Low-Mass Stars in the Pleiades. John R. Stauffer, Lee Hartmann, David R. Soderblom.

and Neal Burnham. 280, 202, 51-C4 (1984)

SPALDING, J. D. A High-Resolution Study of the Isotopes of Solar Flare Nuclei. R. A. Mewaldt, J. D. Spalding, and E. C. Stone. 280, 892, 59-E4 (1984)

SPARKE, LINDA S. Galactic Warps and the Shape of Heavy Halos. Linda S. Sparke. 280, 117, 50-C8 (1984)

SPICER, D. S. Beam-Return Current Systems in Solar Flares. D. S. Spicer and R. N. Sudan. 280, 448, 53-G2 (1984)

SPINRAD, HYRON. 3C 324—An Extremely Distant Cluster Radio Galaxy. Hyron Spinrad and S. Djorgovski. 280, L9, 54-C11 (1984)

STATLER, THOMAS. Stochastic Self-propagating Star Formation in Threedimensional Disk Galaxy Simulations: Erratum. Thomas Statler, Neil Comins, and Bruce Smith. 280, 937, 60-B1 (1984) (Orig. paper in 270, 79, 77-G3)

STAUFFER, JOHN R. Optical and Infrared Photometry of Late-Type Stars in the Pleiades. John R. Stauffer. 280, 189, 51-B3 (1984)

Rotational Velocities of Low-Mass Stars in the Pleiades. John R. Stauffer, Lee Hartmann, David R. Soderblom, and Neal Burnham. 280, 202, 51-C4 (1984)

Evolution of the Optical Spectrum of HM Sagittae: 1977-1982. John R. Stauffer. 280, 695, 57-D7 (1984)

STECHER, THEODORE P. Ultraviolet Spectroscopy of the Planetary Nebula in the Fornax Galaxy. Stephen P. Maran, Theodore R. Gull, Theodore P. Stecher, Lawrence H. Aller, and Charles D. Keyes. 280, 615, 56-E7 (1984)

STEINER, J. E. Identification of Two Hard X-Ray Emitting Be Stars Using the HEAO I Scanning Modulation Collimator. J. E. Steiner, A. Ferrara, M. Garcia, J. Patterson, D. A. Schwartz, R. S. Warwick, M. G. Watson, and J. E. McClintock. 280, 688, 57-C14 (1984)

STEINOLFSON, R. S. Radiative and Reconnection Instabilities: Filaments and Flares. G. Van Hoven, T. Tachi, and R. S. Steinolfson. 280, 391, 53-B13 (1984)

STINEBRING, DANIEL R. Pulsar Polarization Fluctuations. II. 800 MHz Statistical Summaries (Abstract of Paper in 1984 June Suppl.). Daniel R. Stinebring, J. M. Cordes, J. M. Weisberg, Joanna M. Rankin, and Valentin Boriakoff. 280, 939, 60-B3 (1984)

Pulsar Polarization Fluctuations. I. 1404 MHz Statistical Summaries (Abstract of Paper in 1984 June Suppl.). Daniel R. Stinebring, J. M. Cordes, Joanna M. Rankin, J. M. Weisberg, and Valentin Bor-

iakoff. 280, 939, 60-B3 (1984)

STOCKE, J. R. The Radio Properties of the Broad Absorption-Line Quasars. J. R. Stocke, C. B. Foltz, R. J. Weymann, and W. A. Christiansen. 280, 476, 55-B2 (1984)

STONE, E. C. A High-Resolution Study of the Isotopes of Solar Flare Nuclei. R. A. Mewaldt, J. D. Spalding, and E. C. Stone. 280, 892, 59-E4 (1984)

STONER, RONALD. C IV A1550 Emission Profiles in *IUE* Spectra of Syefert I Galaxies. *Ronald Stoner and Roger Ptak.* 280, 516, 55-D14 (1984)

STRITTMATTER, P. A. The Radio Morphology of the X-Ray Radio Sources near 0454+844 and 1803+784. K. J. Johnston, P. Biermann, A. Eckart, H. Kühr, P. A. Strittmatter, R. G. Strom, A. Witzel, and A. Zensus. 280, 542, 55-F13 (1984)

STROM, R. G. The Radio Morphology of the X-Ray Radio Sources near 0454 + 844 and 1803 + 784. K. J. Johnston, P. Biermann, A. Eckart, H. Kühr, P. A. Strittmatter, R. G. Strom, A. Witzel, and A. Zensus. 280, 542, 55-F13 (1984)

STRYKER, L. L. Faint Star Studies in the Magellanic Clouds. II. Field Regions 9° Northeast of the LMC Bar (Abstract of Paper in 1984 June Suppl.). L. L. Stryker. 280, 938, 60-B2 (1984)

SUDAN, R. N. Beam-Return Current Systems in Solar Flares. D. S. Spicer and R. N. Sudan. 280, 448, 53-G2 (1984)

SUSSKIND, J. The 12 Micron Band of Ethane: High-Resolution Laboratory Analysis with Candidate Lines for Infrared Heterodyne Searches. S. J. Daunt, A. K. Atakan, W. E. Blass, G. W. Halsey, D. E. Jennings, D.C. Reuter, J. Susskind, and J. W. Brault. 280, 921, 59-G9 (1984)

SUTHERLAND, PETER G. Models for Type I Supernovae: Partially Incinerated White Dwarfs. Peter G. Sutherland and J. Craig Wheeler. 280, 282, 52-B2 (1984)

SWANK, J. H. Models of the Hard X-Ray Spectrum of AM Herculis and Implications for the Accretion Rate. J. H. Swank, A. C. Fabian, and R. R. Ross. 280, 734, 57-G3 (1984)

SZKODY, PAULA. An Unprecedented UV/Optical Flare in TV Columbae. Paula Szkody and Mario Mateo. 280, 729, 57-F13 (1984)

TAAM, RONALD E. Double-Core Evolution. II. Two-dimensional Hydrodynamic Effects. Peter Bodenheimer and Ronald E. Taam. 280, 771, 58-C7 (1984)

TACHI, T. Radiative and Reconnection Instabilities: Filaments and Flares. G. Van Hoven, T. Tachi, and R. S. Steinolfson. 280, 391, 53-B13 (1984)

TAKAKURA, T. Hard X-Ray Imaging of the Solar Flare on 1981 May 13 with the Hinotori Spacecraft. S. Tsuneta, T. Takakura, N. Nitta, K. Ohki, K. Tanaka, K. Makishima, T. Murakami, M. Oda, Y. Ogawara, and I. Kondo. 280, 887, 59-D12 (1984)

TAN, TAI-HO. The Laboratory Simulation of Unmagnetized Supernova Remnants: Absence of a Blast Wave. Joseph E. Borovsky, Morris B. Pongratz, Robert A. Roussel-Dupré, and Tai-Ho Tan. 280, 802,

58-E10 (1984)

TANAKA, K. Hard X-Ray Imaging of the Solar Flare on 1981 May 13 with the Hinotori Spacecraft. S. Tsuneta, T. Takakura, N. Nitta, K. Ohki, K. Tanaka, K. Makishima, T. Murakami, M. Oda, Y. Ogawara, and I. Kondo. 280, 887, 59-D12 (1984)

TANAKA, WATARU. Absolute Photometry of the Southern Orion Region

in the Vacuum Ultraviolet (1300-2000 Å). Wataru Tanaka, Takashi Onaka, Mineo Sawamura, Tetsuya Watanabe, Keiichi Kodaira,

and Keizo Nishi. 280, 213, 51-D1 (1984)

TANAKA, Y. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

TAWARA, Y. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

TELESCO, C. M. Infrared Observations of the 3C 273 Jets. J. Patrick Henry, E. E. Becklin, and C. M. Telesco. 280, 98, 50-B1 (1984)

TERRELL, J. Long-Term Observations of X-Ray Sources: The Aquila-Serpens-Scutum Region. W. C. Priedhorsky and J. Terrell. 280, 661, 57-A14 (1984)

THORNE, L. R. The Chemistry of Phosphorus in Dense Interstellar Clouds. L. R. Thorne, V. G. Anicich, S. S. Prasad, and W. T.

Huntress, Jr. 280, 139, 50-E3 (1984)

THRONSON, HARLEY A., JR. NGC 2024: Far-Infrared and Radio Molecular Observations. Harley A. Thronson, Jr., Charles J. Lada, P. R. Schwartz, Howard A. Smith, J. Smith, W. Glaccum, D. A. Harper, and R. F. Loewenstein. 280, 154, 50-F5 (1984)

TOKUNAGA, ALAN T. The Spatial Extent of the 3.3 Micron Emission Feature in the Seyfert Galaxy NGC 7469. Roc M. Cutri, Richard J. Rudy, G. H. Rieke, Alan T. Tokunaga, and S. P. Willner. 280, 521, 55-E6 (1984)

TORRES, ANA V. The Spectra of Wolf-Ravet Stars. II. The WC 9 Subclass. Ana V. Torres and Peter S. Conti. 280, 181, 51-A6 (1984)

TRAMIEL, LEONARD J. Polarization Evidence for the Isotropy of Electrons Responsible for the Production of 5-20 keV X-Rays in Solar Flares. Leonard J. Tramiel, Gary A. Chanan, and R. Novick. 280, 440, 53-F8 (1984)

TREVES, A. Two-Temperature Model of Spherical Accretion onto a Black Hole. M. Colpi, L. Maraschi, and A. Treves. 280, 319, 52-D11 (1984)

TSUNEMI, H. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K. Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)

TSUNETA, S. Hard X-Ray Imaging of the Solar Flare on 1981 May 13 with the Hinotori Spacecraft. S. Tsuneta, T. Takakura, N. Nitta, K. Ohki, K. Tanaka, K. Makishima, T. Murakami, M. Oda, Y.

Ogawara, and I. Kondo. 280, 887, 59-D12 (1984)

TUOHY, I. R. Supernova Remnants in the Magellanic Clouds (Abstract of Paper in 1984 June Suppl.). D. S. Mathewson, V. L. Ford, M. A. Dopita, I. R. Tuohy, B. Y. Mills, and A. J. Turtle. 280, 938, 60-B2 (1984)

TUPPER, B. O. J. Imperfect Fluid Cosmologies with Thermodynamics: Some Exact Solutions. A. A. Coley and B. O. J. Tupper. 280, 26, 49-C6 (1984)

TURNSHEK, DAVID A. Properties of the Broad Absorption-Line QSOs. David A. Turnshek. 280, 51, 49-E6 (1984)

TURTLE, A. J. Supernova Remnants in the Magellanic Clouds (Abstract of Paper in 1984 June Suppl.). D. S. Mathewson, V. L. Ford, M. A. Dopita, I. R. Tuohy, B. Y. Mills, and A. J. Turtle. 280, 938, 60-B2 (1984)

UNDERHILL, ANNE B. Do Bipolar Magnetic Regions Exist on the Surfaces of Early-Type Stars? Anne B. Underhill and Richard P. Fahey. 280, 712, 57-E11 (1984)

URRY, C. M. Luminosity Enhancement in Relativistic Jets and Altered Luminosity Functions for Beamed Objects. C. M. Urry and R. A. Shafer. 280, 569, 55-A14 (1984)

VAN DEN BERGH, SIDNEY. The Expansion Age of the Supernova Remnant RCW 89 = MSH 15-52 (G320.4-1.2). Sidney van den Bergh and Karl W. Kamper. 280, L51, 60-E1 (1984)

VAN HOVEN, G. Radiative and Reconnection Instabilities: Filaments and Flares. G. Van Hoven, T. Tachi, and R. S. Steinolfson. 280, 391, 53-B13 (1984)

VEDRENNE, G. Time History, Energy Spectrum, and Localization of an Unusual Gamma-Ray Burst. C. Barat, K. Hurley, M. Niel, G. Vedrenne, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, T. L. Cline, I. V. Estulin, V. M. Zenchenko, and V. G. Kurt. 280, 150, 50-E14 (1984)

VLAHOS, LOUKAS, Comparative Study of the Loss Cone-driven Instabilities in the Low Solar Corona. R. R. Sharma and Loukas Vla-

hos. 280, 405, 53-D1 (1984)

WALBORN, NOLAN R. Ultraviolet Spectral Morphology of the O Stars: The Remarkable Luminosity Dependence of the Si IV Stellar Wind Effect. Nolan R. Walborn and Robert J. Panek. 280, L27, 54-E3

WALKER, R. C. H2O in W49N. II. Statistical Studies of Hyperfine Structure, Clustering, and Velocity Distributions. R. C. Walker. 280, 618, 56-E10 (1984)

WANG, ZHENGZHI. Linear Astrophysical Dynamos in Rotating Spheres: Differential Rotation, Anisotropic Turbulent Magnetic Diffusivity, and Solar-Stellar Cycle Magnetic Parity. Hirokazu Yoshimura, Zhengzhi Wang, and Fei Wu. 280, 865, 59-C3 (1984)

WARD, MARTIN. 1-20 Micron Infrared Photometry of 3CR Radio Galaxies. Martin Elvis, S. P. Willner, G. Fabbiano, N. P. Carleton, A.

Lawrence, and Martin Ward. 280, 514, 56-B5 (1984) WARWICK, R. S. Identification of Two Hard X-Ray Emitting Be Stars Using the HEAO 1 Scanning Modulation Collimator. J. E. Steiner, A. Ferrara, M. Garcia, J. Patterson, D. A. Schwartz, R. S. War-

wick, M. G. Watson, and J. E. McClintock. 280, 688, 57-C14 (1984) WATANABE, M. Digital Surface Photometry of Galaxies toward a Quantitative Classification. III. A Mean Concentration Index as a Parameter Representing the Luminosity Distribution. S. Okamura, K. Kodaira, and M. Watanabe. 280, 7, 49-A13 (1984)

WATANABE, TETSUYA. Absolute Photometry of the Southern Orion Region in the Vacuum Ultraviolet (1300-2000 Å). Wataru Tanaka, Takashi Onaka, Mineo Sawamura, Tetsuya Watanabe, Keiichi Kodaira, and Keizo Nishi. 280, 213, 51-D1 (1984)

WATSON, M. G. Identification of Two Hard X-Ray Emitting Be Stars Using the HEAO 1 Scanning Modulation Collimator. J. E. Steiner, A. Ferrara, M. Garcia, J. Patterson, D. A. Schwartz, R. S. Warwick, M. G. Watson, and J. E. McClintock. 280, 688, 57-C14 (1984)

WEFEL, J. P. The Path-Length Distribution for Galactic Cosmic-Ray Propagation: An Energy-Dependent Depletion of Short Path Lengths. M. Garcia-Munoz, T. G. Guzik, J. A. Simpson, and J. P. Wefel. 280, L13, 54-D4 (1984)

WEILER, E. J. Abundance of Interstellar Aluminum, E. S. Barker, P. M. Lugger, E. J. Weiler, and D. G. York. 280, 600, 56-D5 (1984)

WEIS, EDWARD W. Photometric Parallaxes for Selected Stars of Color Class m from the NLTT Catalog (Abstract of Paper in 1984 June Suppl.). Edward W. Weis. 280, 940, 60-B4 (1984)

WEISBERG, J. M. Pulsar Polarization Fluctuations. I. 1404 MHz Statistical Summaries (Abstract of Paper in 1984 June Suppl.). Daniel R. Stinebring, J. M. Cordes, Joanna M. Rankin, J. M. Weisberg, and Valentin Boriakoff. 280, 939, 60-B3 (1984)

Pulsar Polarization Fluctuations. II. 800 MHz Statistical Summaries (Abstract of Paper in 1984 June Suppl.). Daniel R. Stinebring, J. M. Cordes, J. M. Weisberg, Joanna M. Rankin, and Valentin Bor-

iakoff. 280, 939, 60-B3 (1984)

WESEMAEL, F. The Close Binary Central Star of the Planetary Nebula Abell 41: A Helium-rich Subdwarf Primary. Richard F. Green, James Liebert, and F. Wesemael. 280, 177, 51-A1 (1984)

The Far-Ultraviolet Energy Distribution of Sirius B from Voyager 2. J. B. Holberg, F. Wesemael, and I. Hebený. 280, 679, 57-C5 (1984)

WEYMANN, R. J. The Radio Properties of the Broad Absorption-Line Quasars. J. R. Stocke, C. B. Foltz, R. J. Weymann, and W. A. Christiansen. 280, 476, 55-B2 (1984)

WHEELER, J. CRAIG. Models for Type I Supernovae: Partially Incinerated White Dwarfs. Peter G. Sutherland and J. Craig Wheeler. 280, 282, 52-B2 (1984)

WHITE, RAYMOND E., III. Infall in Elliptical Galaxies. Raymond E. White III and Roger A. Chevalier. 280, 561, 56-A6 (1984)

WIEHL, HERBERT J. Decimetric Gyrosynchrotron Emission during a Solar Flare. David A. Batchelor, Arnold O. Benz, and Herbert J. Wiehl, 280, 879, 59-D3 (1984)

WILKING, BRUCE A. NGC 6334-V-An Infrared Bipolar Nebula. Paul M. Harvey and Bruce A. Wilking. 280, L19, 54-D9 (1984)

WILLNER, S. P. 1-20 Micron Infrared Photometry of 3CR Radio Gal-

- axies. Martin Elvis, S. P. Willner, G. Fabbiano, N. P. Carleton, A. Lawrence, and Martin Ward. 280, 514, 56-B5 (1984)
- The Spatial Extent of the 3.3 Micron Emission Feature in the Seyfert Galaxy NGC 7469. Roc M. Cutri, Richard J. Rudy, G. H. Rieke, Alan T. Tokunaga, and S. P. Willner. 280, 521, 55-E6 (1984)
- WILSON, JAMES R. A Numerical Study of Nonspherical Black Hole Accretion. II. Finite Differencing and Code Calibration (Abstract of Paper in 1984 June Suppl.). John F. Hawley, Larry L. Smarr, and James R. Wilson. 280, 938, 60-B2 (1984)
- WILSON, T. L. The 8.7 GHz Hyperfine Line of 'He* in Galactic H II Regions. Robert T. Rood, T. M. Bania, and T. L. Wilson. 280, 629, 56-F7 (1984)
- WITZEL, A. The Radio Morphology of the X-Ray Radio Sources near 0454+844 and 1803+784. K. J. Johnston, P. Biermann, A. Eckart, H. Kühr, P. A. Strittmatter, R. G. Strom, A. Witzel, and A. Zensus. 280, 542, 55-F13 (1984)
- WU, CHI-CHAO. The Dust around R Coronae Borealis Type Stars. J. H. Hecht, A. V. Holm, B. Donn, and Chi-Chao Wu. 280, 228, 51-E3 (1984)
- Wu, Fei. Linear Astrophysical Dynamos in Rotating Spheres: Differential Rotation, Anisotropic Turbulent Magnetic Diffusivity, and Solar-Stellar Cycle Magnetic Parity. Hirokazu Yoshimura, Zhengzhi Wang, and Fei Wu. 280, 865, 59-C3 (1984)
- YAMASHITA, K. Secular Variation and Short-Term Fluctuations of the Pulse Period of Vela X-1. F. Nagase, S. Hayakawa, H. Kunieda, K. Masai, N. Sato, Y. Tawara, H. Inoue, K. Koyama, F. Makino, K. Makishima, M. Matsuoka, T. Murakami, M. Oda, Y. Ogawara, T. Ohashi, N. Shibazaki, Y. Tanaka, S. Miyamoto, H. Tsunemi, K.

- Yamashita, and I. Kondo. 280, 259, 51-G6 (1984)
- YEE, H. K. C. An Imaging Survey of Fields around Quasars. II. The Association of Galaxies with Quasars. H. K. C. Yee and Richard F. Green. 280, 79, 49-G10 (1984)
- YORK, D. G. Abundance of Interstellar Aluminum. E. S. Barker, P. M. Lugger, E. J. Weiler, and D. G. York. 280, 600, 56-D5 (1984)
 - Splitting of C IV Lines in a QSO Absorption-Line System. D. G. York, Richard F. Green, Jill Bechtold, and Frederic H. Chaffee, Jr. 280, L1, 54-C2 (1984)
- YOSHIMURA, HIROKAZU. Linear Astrophysical Dynamos in Rotating Spheres: Differential Rotation, Anisotropic Turbulent Magnetic Diffusivity, and Solar-Stellar Cycle Magnetic Parity. Hirokazu Yoshimura, Zhengzhi Wang, and Fei Wu. 280, 865, 59-C3 (1984)
- ZENCHENKO, V. M. Time History, Energy Spectrum, and Localization of an Unusual Gamma-Ray Burst. C. Barat, K. Hurley, M. Niel, G. Vedrenne, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, T. L. Cline, I. V. Estulin, V. M. Zenchenko, and V. G. Kurt. 280, 150, 50-E14 (1984)
- ZENSUS, A. The Radio Morphology of the X-Ray Radio Sources near 0454+844 and 1803+784. K. J. Johnston, P. Biermann, A. Eckart, H. Kühr, P. A. Strittmatter, R. G. Strom, A. Witzel, and A. Zensus. 280, 542, 55-F13 (1984)
- ZIMMERMAN, ROBERT L. Primordial Gravitational Waves and the Black-body Radiation Anisotropy. Peter J. Adams, Ronald W. Hellings, and Robert L. Zimmerman. 280, L39, 60-D4 (1984)
- ZUCKERMAN, B. The T Tauri Radio Source. P. R. Schwartz, Theodore Simon, B. Zuckerman, and R. R. Howell. 280, L23, 54-D13 (1984)

